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that cultivation be carried farther, until, if possible, ascus fruit is produced from the thallus.

Bonnier had noticed that moss protonema was attacked by some kind of fungus, and it occurred to him that the lichen-building fungus might be brought to use another host if the proper alga forms were not to be obtained. He therefore cultivated moss protonema on sterilized sand, in an apparatus arranged so that no germs were allowed to enter from the air. In this way he raised several mosses, *Hypnum cupressiforme*, *Barbula muralis*, *Funaria hygrometrica*, *Mnium hornum*, *Dicranella varia* and *Phascum cuspidatum*. On these developed cultures he then sowed the lichen spores. In other cases he sowed lichen and moss spores at the same time. He was able to follow the growth of these spores, some of them, under the microscope; saw the protonema of the moss seized by the growing lichen spore and gradually invested with it in the same manner as observed in the case of filamentous algæ. These hyphæ, branching and anastomosing, finally built an elegant network about the moss-protonema.

Bonnier then tried to substitute other algæ forms in lichens having only a certain kind. He placed the germinating lichen spores in the presence of the foreign algæ, but in, most cases, failed to produce a thallus. Twice in case of *Parmelia parietina* however, he succeeded. The normal alga of this lichen is *Protococcus viridis* and he obtained lichens with *Protococcus botryoides*, and what is still more conclusive, with an alga of quite different form, namely, *Trentepohlia abietina*, a reddish filamentous alga. E. L. G.

Index to Recent American Botanical Literature.

Acrostichum Hartii, Baker, n. sp.—J. G. Baker. (Journ. Bot., xxvi., 371). Description of a new species from Trinidad, named for the collector, Mr. John Hart.

Andropogon—Notes on.—F. Lamson Scribner. (Bot. Gazette, xiii., 294–296.)

Berberis Fendleri.—Serenio Watson. (Garden and Forest, i., 460, fig. 72.)

Berberis Fremonti.—Sereno Watson. (Garden and Forest, i., 496, fig. 77.)

Black Rot. (*Læstadia Bidwellii*.) F. Lamson Scribner and Pierre Viala. (U. S. Dept. Agric., Botanical Division, Bull. No. 7, pp. 29, Washington, 1888.)

A report of observations made during 1887 on the ravages of this pest of the grape; portions of it have been already published in French by Prof. Viala, under the title "Le Black Rot in Amerique," and to these are added the results of successful experiments on the treatment of the disease during the past season. There is a very interesting chapter on the origin and history of the malady. The fungus causing it is native to East America, and is found on most of the wild vines. Its oldest specific name is *uvicola*, Berkeley and Curtis, who placed it in the genus *Phoma*. Mr. Ellis first described the perithecial stage as *Sphæria Bidwellii*. There have been a variety of other names applied to it, and now Prof. Scribner tells us that "a minute study of the perithecia, both in America and France, has caused us to classify the fungus in the genus *Læstadia*. The only specific name which now ought to be given it is *Læstadia Bidwellii*." Now we are quite willing that mycologists should decide whether or no the name given the original imperfect form should stand, but inasmuch as Kunth applied the generic name *Læstadia* to a genus of Andean Compositæ as early as 1833, while as applied by Auerswald to fungi it dates from only 1869, we would submit that the binomial accepted by Profs. Viala and Scribner cannot stand under any circumstances.

Botanic Garden for the City of New York.—C. S. Sargent. (Garden and Forest, i., 517, 518.)

Professor Sargent ably states the advantages of a great botanical garden to the city of New York and to botanical science, and indicates the lines upon which such an establishment should be administered, the elements available for its foundation, and the needs of such an undertaking.

Botany at the University of Gottingen.—W. E. Stone. (Bot. Gazette, xiii., 287-294.)

Botany for Academies and Colleges, consisting of Plant Develop-

ment and Structure from Seaweed to Clematis, and a Manual of Plants, including all the Known Orders with their representative Genera.—Annie Chambers-Ketchum. (Small 8vo., pp. 190 and 192, Philadelphia, 1889.)

The plan of this new book follows the Jussieuian method, beginning with the consideration of the most lowly plants and leading up to that of the Anthophyta. The terminology adopted for the lower groups is antique. We were not prepared to see the names Thallogens and Acrogens—the latter here including both the moss tribe and the fern alliance—used again, and can but regret that they have been employed by Mrs. Chambers-Ketchum. The book is thoroughly illustrated, many of the cuts being taken from original drawings. There are chapters on the past history of plants, on plant chemistry, on the several systems of classification, and on nomenclature and pronunciation. The tables of what are called Etymons, giving both the derivations of common words and those of proper names, are very useful. The “Manual of Plants” composing the second part of the book, contains an immense amount of information in a very small space.

Chekan. (*Eugenia Chequen*, Mol.) H. H. Rusby. (Druggists' Bulletin, Nov., 1888, with cut. Reprinted.)

Composite in Medicine.—H. H. Rusby. (Pharm. Rec., Dec. 1, 1888. Reprinted.)

A brief consideration of the chief medicinal species, compiled with special reference to the want of uniformity which exists in the constituents and properties of this natural order.

Cork-wings on certain trees.—Development of.—Emily L. Gregory. (Bot. Gazette, xiii., 249–258, 281–287, 312–317; two plates.)

Diatomaceous formations of Virginia in connection with some recent discoveries made in the excavation of the Eighth Street tunnel at Richmond.—C. L. Peticolas. (The Microscope, viii., 327–330.

A description of the location and extent of these world-renowned deposits, with some conclusions regarding their geological position. As might be expected, the paper is one of considerable interest, for the author has enjoyed special advantages for the study of these formations.

C. H. K.

Diatoms and other Algæ of New Haven Harbor and adjacent Waters.—Wm. A. Terry. (Amer. Month. Micros. Journ., ix., 225-227.)

An interesting contribution to our knowledge of the diatoma-cæ of Long Island Sound. It is to be hoped that the author will continue his researches and follow this paper with a complete catalogue of species. C. H. K.

Diæcism in Andropogon provincialis.—A. A. Crozier. (Bot. Gazette, xiii., 302.)

Flora of the vicinity of San Francisco.—By H. H. Behr, M.D., Prof. of Botany in the California College of Pharmacy.

Want of originality is a fault which certainly can never be charged against the author of this book. A Linnæan key to the generi contrasts strangely enough with the most modern ideas in the treatment of some portions of his subject. We note particularly the brief diagnostic descriptions of species which render it possible to produce a convenient little hand-book. With all its faults of arrangement, the work must be found a great convenience to those who wish to carry their key into the field with them. H. H. R.

Fossil Plants—Evidence of the, as to the age of the Potomac Formation.—Lester F. Ward. (Amer. Jour. Sci., xxxvi., 119-131.)

Fungi which kill insects.—Otto Lugger. (Exp. Sta. University of Minnesota, Bull. No. 4, 26-41, nine figures.)

Grønland's Vegetation.—Eug. Warming. (Engler's Bot. Jahr., x., 364-409.) An exhaustive account of the character and distribution of the Flora of Greenland.

Guatemala.—Undescribed plants from.—John Donnell Smith. (Bot. Gazette, xiii., 299, 300; two plates.) *Hanburia parviflora* and *Calea trichotoma* are described.

Heather in Townsend, Mass.—George L. Goodale. (Amer. Journ. Sci., xxxvi., 295-296.) Another locality for *Calluna vulgaris* is reported, discovered by Mr. Ralph Ball. Dr. Goodale presents conclusive evidence that it was introduced from Europe some twenty years ago.

History of Garden Vegetables.—E. Lewis Sturtevant. (Amer. Nat., xxii., 979–987; continued.) Kohl-rabi (*Brassica oleracea, caulorapa*), Lavender (*Lavendula vera*), Leek (*Allium Porrum*), Lentil (*Ervum Lens*) and Lettuce in its various forms (*Lactuca sativa*), are here discussed.

Introduction to Entomology.—Part I.—John Henry Comstock. (8 vo., pp., 234, Ithaca, 1888.)

The study of insect life is so closely associated with certain branches of botany that mention of this new work will not be considered out of place. It is both structural and systematic, the first two chapters being devoted to an exposition of the characters, metamorphoses and anatomy of insects. The remainder of the book contains descriptions of families and orders, the determinations being aided by analytical keys, similar to those used with such advantage in our botanies. Mrs. Comstock has contributed much to the value of the work in drawing and engraving most of the illustrations from original material.

List of plants found growing wild within thirty miles of Amherst. N. A. Cobb. (Pamph., 8vo., pp. 51, 1887).

Although published nearly two years ago, this local catalogue has only recently come to our notice. It is an extension of Prof. Tuckerman's list of the same region, published in 1875, and includes representatives of all the sub-kingdoms, a goodly number of Protophyta being recorded. Localities are given for the scarcer flowering plants and ferns, but the lower classes are merely enumerated.

Michigan Agricultural College—First Annual Report of the Department of Botany and Forestry. W. J. Beal. (Pamph., pp. 25, Agricultural College, 1888.)

Besides the records of work accomplished at the Experiment Station and its outlying farms, Professor Beal contributes chapters on the Flora of Northern Michigan, on that of the "Jack-pine Plains," and comparisons of the Michigan Flora on the east and west sides of the State, in latitude 44° 40'.

Oenothera albicaulis. F. W. Anderson. (Bot. Gazette, xiii., 300, 301.)

Mr. Anderson records the offensive odor emanating from the flowers of this species.

Pentstemon rotundifolius. Sereno Watson. (Garden and Forest, i., 472, fig. 73.) C. G. Pringle. (l. c., 496.)

Pharmaceutical Habitat Map of France. P. W. Bedford. (Pharm. Rec., Dec. 15, 1888.)

This is one of the most carefully prepared and instructive things of its kind that we have seen. Its practical value is enhanced by an alphabetical descriptive index on p. 393. Unfortunately there are quite a number of typographical errors.

H. H. R.

Primula Rusbyi, Greene. J. D. Hooker. (Bot. Mag. t. 7, 032.)

Comparing this species with *P. Parryi*, Sir Joseph Hooker remarks that judging from dried specimens and the figure before us, the flowers are not, as stated by Mr. Greene, so large nor brightly colored as those of the latter species. While this is unquestionably true, yet the discrepancy is not so great as would seem from this figure. The plant appears, like so many of our Primulaceæ, to vary considerably. The figure displays a plant taller and more slender, and with more numerous and narrower flowers, the color less vivid and the eye less prominent, than in the specimens that I collected in the Mogollon Mountains. Of these specimens Mr. Greene received the largest and showiest. It is clear that neither the plants collected by Mr. Pringle, nor those of Mr. Lemmon, had such well developed flowers as those of the type. There are other characters besides the size of the flowers which make Parry's species more attractive in its native habitat. It grows three or four times as tall, and in masses or rows among the rocks, these presenting patches of brilliant bloom. On Mt. Humphreys, where I collected it July 3, 1883, I was obliged to dig through several inches of snow to secure the roots. The *P. Rusbyi*, on the other hand, grows scattered over rich lightly wooded hill-sides, and is a much less luxuriant grower.

H. H. R.

Protococcus—An elementary Study in Biology. Henry L. Osborn. (Amer. Month. Micros. Journ., ix., 183-186, fourteen figures.)

Quercus virens.—*The Live Oak*. C. S. Sargent. (Garden and Forest, i., 476, fig. 74.)

Report of the Botanist New York State Museum of Natural History. Chas H. Peck. (41st Ann. Rep. Trustees, 1887, pp. 51-122 ; four illustrations.)

Mr. Peck's present report contains much information of interest and value not alone to New York botanists, but to all. Enumeration is made of twenty-six species of flowering plants not before recorded as growing within the State, most of them introduced, but including *Aster junceus* ; *Salix amygdaloides* ; *Potamogeton Zizii* ; *P. Hillii* ; *Panicum nervosum* ; *Deyeuxia Porteri* and *Eatonia Dudleyi*, all detected in the Western counties by Professor Dudley. Besides these, there are a great number of Fungi, fifty-two of them described as new, all collected by the indefatigable State botanist himself, mainly in the Adirondack region. Mr. P. H. Dudley contributes one of his important articles on fungi destructive to timber. Not the least valuable chapter is an index to the species mentioned in the Museum Reports Nos. 22 to 38. The growth of the herbarium at Albany is evidenced by the statement that specimens of 170 species were added during 1887, of which number 105 were previously unrepresented.

Rhætic Plants from Honduras. J. S. Newberry. (Amer. Journ. Sci., xxxvi., 342-351 ; one plate.)

Rubiaceen Südamerikas.—*Ueber einige verkannte oder wenig gekannte Geschlechter der*. Karl Schumann. (Engler's Bot. Jahrsb., x., 302-363.)

A long discussion of the limitations and relations of a large number of genera in Rubiaceæ.

Scale-Flowers. (*Mutisia viciæfolia*, Cav.) H. H. Rusby. (Druggists' Bulletin, Dec. 1888, with cut.)

Shortia.—*The story of*. C. S. Sargent. (Garden and Forest, i., 506, fig. 80.)

Strassburg and its Botanical Laboratory. Wm. R. Dudley. (Bot. Gazette. xiii., 305-311.)

Synopsis of the Medical Botany of the United States. J. M. G. Carter, A.M., M.D., etc. (Geo. H. Field, St. Louis, Mo.)

This work on Medical Botany, which is very complete in its way, is rather historical than practical or scientific. No attempt is made to fix upon the real value of the plants in medicine, the names of the species and varieties—to the number of 1300—being given in botanical sequence, and having appended a list of the properties which have at one time or another been credited to them. As a result we have an excellent record of the popular estimate, past and present, of our North American plants, but little that could guide any one, except to certain failure, in their use. Thus we find ascribed to *Hepatica* astringent, hepatic, pectoral, demulcent, deobstruent and tonic properties; and yet its reputation in hepatic disorders is antiquated, having arisen solely from the fancied resemblance of its appearance to that of the liver, and it is now considered by all scientific authorities as being nearly inert. To nine genera in Caryophyllaceæ are ascribed important actions while in reality that family is the type of inertness. We miss from the list of consulted works given in the preface, the name of that one that would have been of most value to our author, the Medical Botany of North America, by Dr. Laurence Johnson. That work, which we have, however, always held to be too conservative, represents more nearly the modern estimate of our vegetable drugs, and challenges a majority of the statements as to medicinal activity made in the pages of the book before us. H. H. R.

Uromyces Trifolii. Lucien W. Underwood. (Bot. Gazette, xiii., 301, 302.)

Proceedings of the Club.

The regular monthly meeting was held Tuesday evening, December 11, 1888, the President in the chair and 20 persons present.

Mr. Sterns, Chairman of the Committee appointed at the last meeting to consider the matter of the proposed Botanic Garden, presented a report, which was accepted, and the Committee was enlarged to eight members.

The amendment to the Constitution proposed at the November meeting, increasing the annual dues from two dollars to four dollars and including all the publications of the Club, was unani-